ZooKeys 16: 301-308 (2009)
doi: 10.3897/zookeys.16.226
www.pensoftonline.net/zookeys

RESEARCH ARTICLE

A peer-reviewed open-access journal
ZooKeys
Launched to accelerate biodiversity research

Lepthyphantes christodeltshev, a new species from Greece (Araneae, Linyphiidae)

Peter van Helsdingen

National Museum of Natural History, Leiden, Netherlands

urn:lsid:zoobank.org:author:1A7B219D-11D4-40EB-91C1-307137F4C59B

Corresponding author: *Peter van Helsdingen* (helsdingen@nnm.nl)

Academic editor: *Jason Dunlop* | Received 16 February 2009 | Accepted 13 May 2009 | Published 29 July 2009

urn:lsid:zoobank.org:pub:37331E52-2B28-46B6-85D7-7366C0E9B91F

Citation: Helsdingen P van (2009) *Lepthyphantes christodeltshev*, a new species from Greece (Araneae, Linyphiidae). In: Stoev P, Dunlop J, Lazarov S (Eds) A life caught in a spider's web. Papers in arachnology in honour of Christo Deltshev. ZooKeys 16: 301-308. doi: 10.3897/zookeys.16.226

Abstract

The male and female of *Lepthyphantes christodeltshev* **sp. n.** are described from mainland Greece. The presently accepted subdivision of *Lepthyphantes* s.l. into separate genera is commented upon and criticized as user-unfriendly. Possible functional aspects of the epigyne and male palp are discussed.

Keywords

Lepthyphantes christodeltshev, lepthyphantine genera, Linyphiidae, Greece

Introduction

Again a new species of *Lepthyphantes* s.l. There seems to be no end to the discovery of new species of this large taxon. Even though *Lepthyphantes* s.l. has been split up in many separate genera through the efforts of Michael Saaristo and Andrej Tanasevitch over the last twelve years it remains a delimited taxon, a group of genera which closely resemble each other and are most likely closely related. The present general procedure for identification of a stray specimen of an unfamiliar species of *Lepthyphantes* s.l. is to try and identify it by leafing through all available papers on all the *Lepthyphantes* sensu lato taxa to try and find a matching illustration of the epigyne or male palp of the specimen at hand. When the specimen has thus been identified the present allocation to one of the recently

Copyright *Peter van Helsdingen.* This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

split-off taxa is noted and the species is named accordingly. If one cannot find a matching illustration one has to find a closely resembling species and describe the new species in the same genus. For the species described here no matching illustration could be found and none of the split-off genera were found suitable to accommodate this species. Therefore it is described in the "mother-genus" *Lepthyphantes* (see under Discussion).

Abbreviations (in the text and illustrations):
AME, anterior median eyes; as, arched part of scape; c, cymbium; e, embolus; h, haematodocha; l, lamella; mp, median plate; pc, paracymbium; PME, posterior median eyes; r, radix; sta, supra-tegular apophysis; s, stretcher; rs, receptaculum seminis; ss, straight part of scape; t, tegulum; ta, terminal apophysis; ti, tibia. Chaetotaxy: l', pro-lateral; l", retro-lateral.

***Lepthyphantes christodeltshev* sp. n.**
urn:lsid:zoobank.org:act:B2AFEBBF-90EE-460B-8954-323DED7F617D

Derivation of name: after Christo Deltshev, the well-known Bulgarian arachologist. Name treated as a noun in apposition.

Material. 1♂ (holotype), Greece, Attiki, Mt. Parnis N of Athens, in litter and grass under pine tree, 500 m, 6.I.1985, C.L. Deeleman leg.; 1♀ (paratype), same sample. The general appearance of the two specimens convinced me that they are the male and female of one and the same species [The locality is Mt. Parnos or Parnis (Parnos Oros) directly north of Athens and not the famous Mountain Parnassus near Delphi]. Both specimens deposited in the collection of the National Museum of Natural History, Leiden, Netherlands.

Description. Since there are only two specimens available (the male holotype and female paratype) I have left both specimens intact as much as possible, so as to keep them fit for further examination. More detailed examination of the genitalia has to wait until additional material becomes available. The illustrations provided here consequently have to remain more schematic and are meant to enable identification and give insight into their anatomy as much as possible.

Male. Species of small size. Colour: Generally light brown, with light grey suffusion on the chelicerae. Sternum and abdomen dark grey. Legs yellow to brown. Abdomen on the dorsal posterior half with three faint chevron markings which are light brown because the grey pigment is lacking there on the otherwise grey abdomen; no white pigment present.

Measurements (in mm): total L 1.9, cephalothorax L 0.85, W 0.65, abdomen L 1.05, W 0.60, H 0.60; chelicerae L 0.28, W 0.15, height of clypeus 0.12.

All eyes of about same size (∅ 0.075), only AME much smaller (∅ 0.037); PME separated by 0.4 times ∅ of PME, AME by 0.67 times ∅ of AME.

Chelicerae. With coarse stridulating files, ridges 0.009 mm apart. Three relatively large pro-marginal teeth of equal size, five small retro-marginal teeth of equal size.

Legs:

	I	II	III	IV	palp
Fe	1.06	0.95	0.82	1.06	0.27
Pa	0.25	0.25	0.21	0.22	0.11
Ti	1.06	0.98	0.75	-	0.15
Mt	0.99	0.89	0.72	-	-
Ta	0.66	0.59	0.44	-	0.30

Fe I with one pro-lateral spine, other femora spineless; all tibiae with two dorsal spines, Ti I with pro-lateral (l') and retro-lateral (l") spine, Ti II with l"-spine only. TmI 0.19. Position of basal d-spine on tibia I 0.33, length of spine 0.20, ∅ 0.087. Metatarsi spineless.

Male palp. Tibia without apophysis; only scar of dorsal spine visible, spine itself broken off. Cymbium simple, without basal dorsal protrusion. Paracymbium (Figs 1, 2) with a sharply pointed tooth at the postero-ventral corner and an equally slender tooth more forward, below inside the tub-shaped element, hidden behind a lobe-like retro-lateral extension of the ventral margin of the element. Suprategular apophysis straight and pointed. Lamella (Figs 1, 3, 4) broad where it emerges from the radix, then narrowing to a slender, curved central section and with a forked end, the two branches at a perpendicular angle. Radix (Fig. 4) with clear Fickert's Gland. Embolus slender, modestly sickle-shaped; no denticles at base visible (as present in some *Tenuiphantes* species). Other details were difficult to distinguish without damaging the palp of the holotype, which was left intact as much as possible.

Female. Coloration as in male. Abdomen with the faint chevron markings over the whole dorsal surface.

Measurements (in mm): total L 2.2, cephalothorax L 0.80, W 0.65, abdomen L 1.45, W 0.95, H 0.90; chelicerae L 0.37, W 0.17, height of clypeus 0.1.

Eyes. All eyes of about the same size (∅ 0.062), only AME slightly smaller (∅ 0.050); PME separated by 0.6 times ∅ of PME, AME by 0.38 times ∅ of AME.

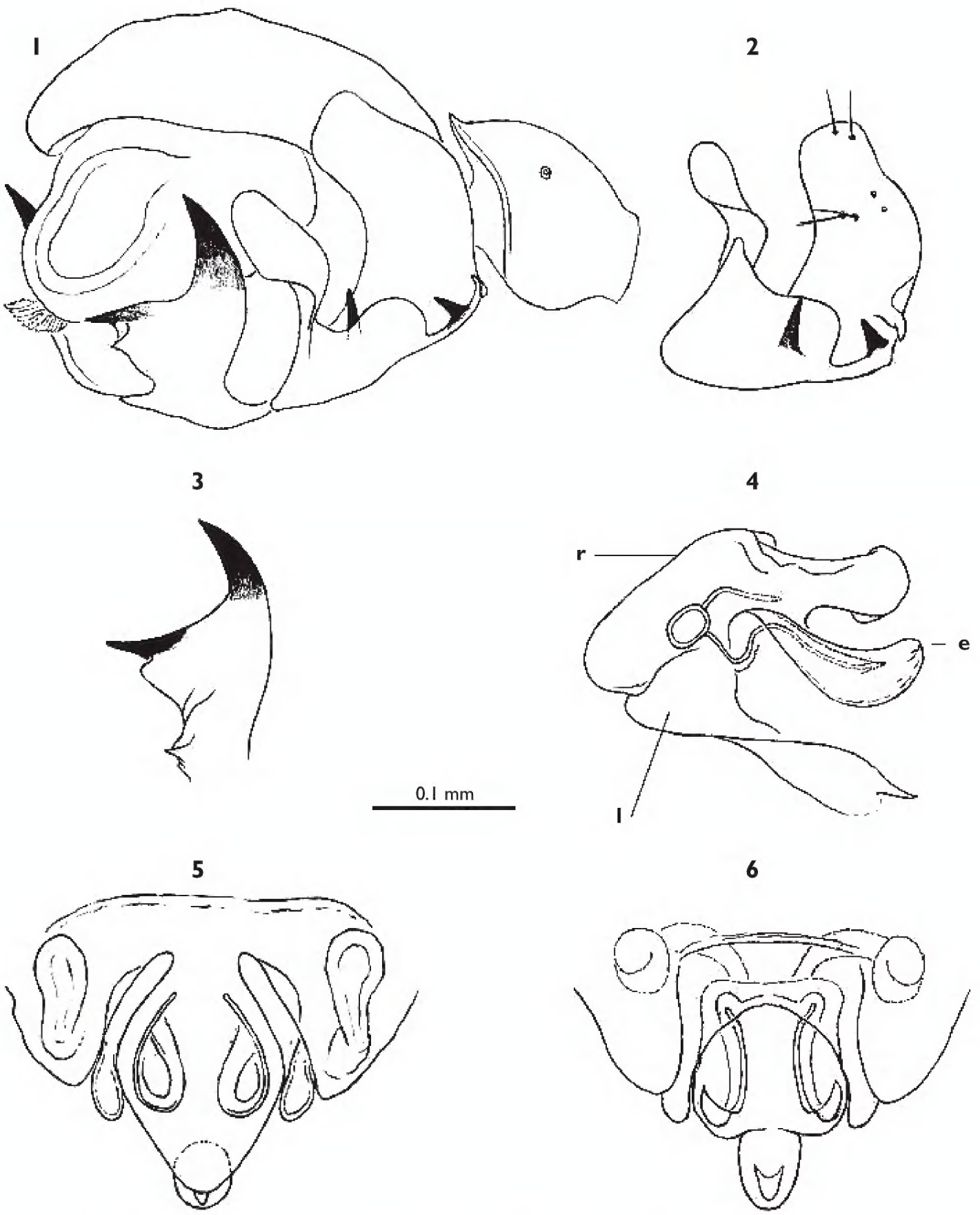
Chelicerae. Stridulating files coarse. Three relatively large pro-marginal teeth of equal size, five small retro-marginal teeth of equal size.

Legs:

	I	II	III	IV
Fe	0.96	0.90	0.76	1.00
Pa	0.25	0.25	0.21	0.21
Ti	1.00	0.90	0.69	1.00
Mt	0.84	0.75	0.61	0.83
Ta	0.59	0.56	0.52	0.51

Fe I with one pro-lateral spine, other femora spineless; all tibiae with two dorsal spines, Ti I with pro-lateral (l') and retro-lateral (l") spine, Ti II with l"-spine only. TmI 0.16. Position of basal d-spine on tibia I 0.36, length of spine 0.26, ∅ 0.087. Metatarsi spineless.

Epigyne and vulval structures (Figs 5-6): The organ is not protruding, but is flush with the ventral surface. The basal part of the scape (ventral view, Fig. 5) is more or less oval, widest in the middle, and projects slightly over the epigastric furrow. A small parmula is visible, but mostly hidden below the scape. A narrow, slit-like space



Figures 1-6. *Lepthyphantes christodeltshev* sp. n. **1** male palp, retro-lateral view **2** paracymbium from slightly more ventrally **3** tip of lamella **4** radical complex, with radix (r), base of lamella (l), and embolus (e) **5** epigyne, ventral aspect **6** epigyne, dorsal aspect.

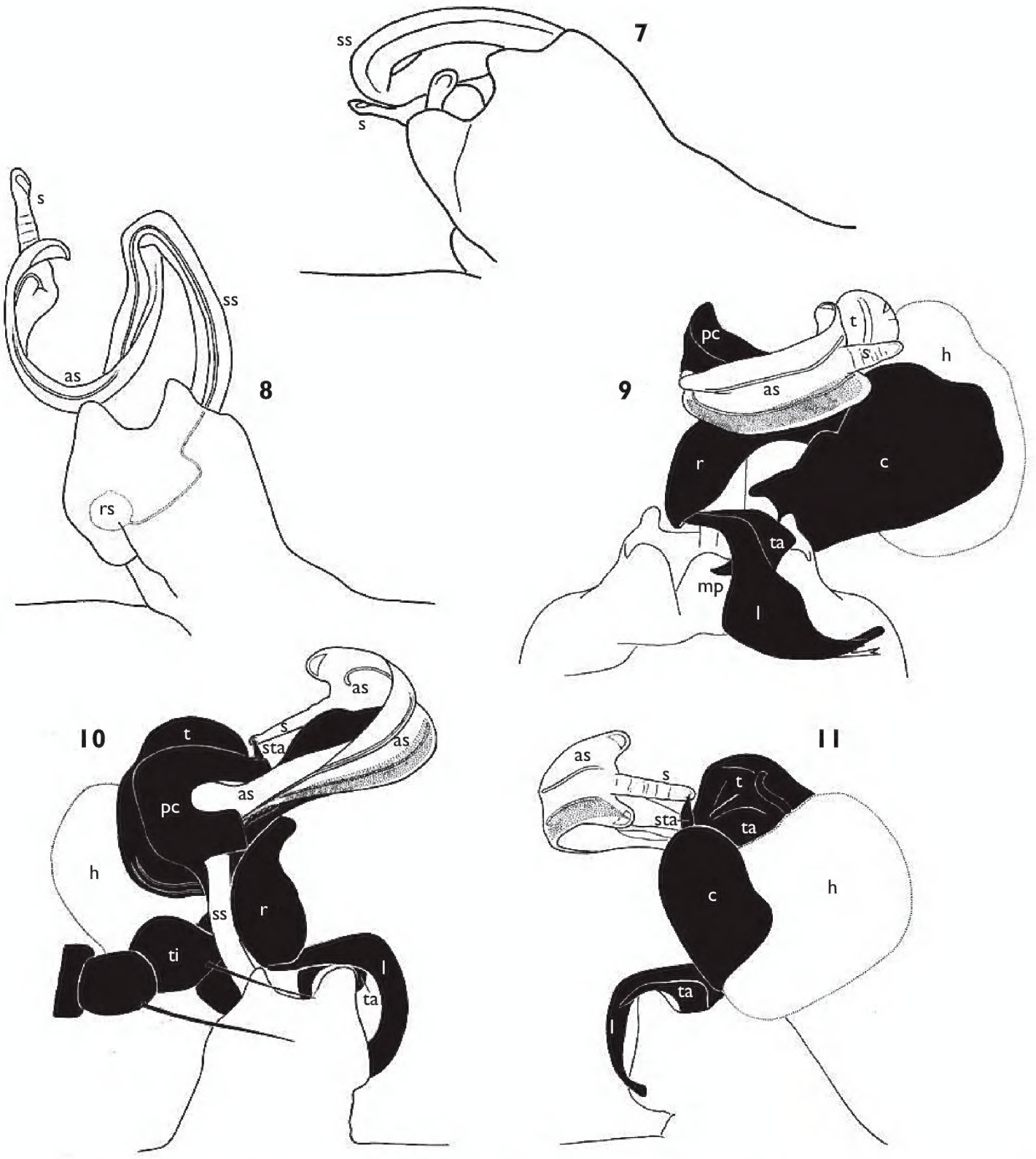
separates the scape from the lateral parts of the epigyne. At either side of the scape, between the widest part of the basal part of the scape and the posterior-most tips of the lateral ventral surface, a rounded structure ("lateral lobe") is visible, the function of which is unknown. The dorsal view (Fig. 6) reveals the knob-shaped parmula with a socket on top of the broad, squarish distal part of the scape; the entrances of the sperm ducts are discernible through the structure (situated at the ventral surface) laterally at the tip just mesally of a socket. I have not flattened the scape to investigate its precise anatomy because I have only this single specimen, but it looks as if the scape is not very flexible; the middle and terminal sections of the scape seem to arise from the dorsal side of the basal section of the scape, not at the tip but slightly more to the front (anterior direction) of that part of the scape. This would agree with the only slightly sickle-shaped embolus of the male (which has to fit into the curved section of the scape). In dorsal view it is clear that the rounded structures at either side if the scape are the extensions of the thin but well-chitinized "posterior median plate", which in this species is a dorsal median plate with concave distal margin; the "lateral lobes" appear to be separated from the bordering lateral ventral surface by a fissure; the lateral lobes and median plate should together be homologous with the posterior median plate in other *Lepthyphantes* species.

Discussion

Classification. Like *Linyphia*, *Neriene*, and *Erigone*, the genus *Lepthyphantes* served as an acceptable place for new species in the earlier days of spider taxonomy. In this way such genera became very large. Subsequent taxonomists transferred species from *Lepthyphantes* to other genera which had been created in the course of time, but even so many new contemporary species were described and thus the genus *Lepthyphantes* remained very rich in species.

Simon (1929) already subdivided the genus into species groups to accommodate the European species. It is mostly through the efforts of Michael Saaristo and Andrej Tanasevitch, separately or as collaborators and occasionally with another collaborator, that the Palaearctic *Lepthyphantes* s.l. species were further divided into many new genera. A few others also worked along this line. Altogether Saaristo and Tanasevitch created 27 new genera, between 1992 and 2006, while several genera were also established by others. Of these 27 genera 15 concern Europe (i.e. contain one or more European species), while the other genera contain non-European (Asian, North-American, and some African) species. The relevant publications are listed in the references (Tanasevitch 1992; Saaristo and Tanasevitch 1996, 1999, 2000, 2001). The genus *Ipa* was even placed in a separate (new) subfamily Ipainae (Saaristo 2007). For an overview of all the new genera, see the list of species transferred to other genera under the genus *Lepthyphantes* in Platnick's Catalog (Platnick 2009). The present genus *Lepthyphantes* is probably not monophyletic but contains the left-overs or species which have not been assigned to species groups; as well as recently described new species with lepthyphantine features.

The subdivision of the genus by the two authors noted above is mainly based on the, often minute, details of the male palp and female epigyne. Other somatic characters were hardly used, with the exception of the presence or absence of an abdominal pattern, or at least they were not mentioned in their publications if the authors had found them. This makes their new classification user-unfriendly. None of the authors



Figures 7-11. *Lepthyphantes leprosus* (Ohlert). **7-8** epigyne, lateral view, in normal resting position (**7**) and after stimulation through courtship (**8**). **9-11** male and female genitalia in functional contact, in caudal view (**9**) from the female's right side (**10**) and the female's left side (**11**); male elements black (haematodocha excepted), female elements white; haematodocha, with stippled outline, much more swollen during copulation, here depicted as shrunken during fixation of the copulatory complex (after van Helsdingen 1965, adapted).

has provided a key or any other tool to distinguish between the many genera they created. In some cases one can recognize a certain pattern of apparent synapomorphies, e.g. in the shape of the epigyneal scape or of the lamella in the male palp, which seem to justify a separate taxon (genus, subgenus or species group). Therefore I prefer to describe this new species in *Lepthyphantes*. It might be close to *Tenuiphantes*, where it keys out using the subdivision of Simon (1929), but this key has become useless since the new taxonomic revisions.

Functional aspects of the genitalia. If we use *Lepthyphantes leprosus* (Ohlert) as an example of the way the genitalia function in the Lepthyphantini in general, and in the genus *Lepthyphantes* s.l. in particular (see van Helsdingen 1965), we can reflect and speculate on possible conformities and differences.

We may presume that the epigyne in *L. christodeltshev* will also be stimulated by male courtship and rise out of its resting position and become ready for copulation, ending up more or less perpendicular to the ventral surface of the female abdomen (compare Figs 7 and 8). During copulation the median suprategular apophysis will pick up the stretcher (parmula) at the tip of the epigyneal scape, finding a foothold there in the small socket, and pull the arched part of the scape around the male embolus. The rather tub-shaped paracymbium will be cupped over the end of the basal section of the scape and the two teeth on the paracymbium probably help to strengthen their grip on each other, preventing the paracymbium from slipping or twisting over the tip of the basal section of the scape. As indicated in the description of the epigyne, the structure of the scape makes it unlikely that the more distal parts of the scape can be distorted as easily as in *Lepthyphantes leprosus* (Ohlert), where the arched apical part is twisted to a position perpendicular to the basal stem and pulled around the disc-shaped male embolus (Figs 9-11). Here we must assume that the distal parts will be pulled around the male embolus too, but not twisted sideways as far as in *L. leprosus* (see Figs 9-11). The pair of sockets at either side at the inside (ventral side) of the distal part of the scape will be picked up by the embolic tooth and thus establish contact between the sperm ducts in the male palp and the sperm duct in the scapus of the epigyne; the entrance of the latter being situated just mesally of the socket. There is no terminal apophysis of any substance to disappear into the epigyneal cavity, which appears to be small.

References

Helsdingen PJ van (1965) Sexual behaviour of *Lepthyphantes leprosus* (Ohlert) (Araneida, Linyphiidae), with notes on the function of the genital organs. Zoologische Mededelingen 41: 15-42.

Platnick NI (2009) The world spider catalog. Version 9.5. American Museum of Natural History. http://research.amnh.org/entomolgy/catalog/index.html

Saaristo MI (2007) A new subfamily of linyphiid spiders based on a new genus created for the *keyserlingi*-group of the genus *Lepthyphantes* (Aranei: Linyphiidae). Arthropoda Selecta 16: 33-42.

Saaristo MI, Tanasevitch AV (1996) Redelimitation of the subfamiy Micronetinae Hull, 1920 and the genus *Lepthyphantes* Menge, 1866 with descriptions of some new genera. Berichte des naturwissenschaftlich-medizinischen Vereins Innsbruck 83: 163-186.

Saaristo MI, Tanasevitch AV (1999) Reclasification of the *mughi*-group of the genus *Lepthyphantes* Menge, 1866 (sensu lato). Berichte des naturwissenschaftlich-medizinischen Vereins Innsbruck 86: 139-147.

Saaristo MI, Tanasevitch AV (2001) Reclassification of the *pallidus-*, *insignis-* and *spelaeorum*-groups of *Lepthyphantes* Menge, 1866 (sensu lato) (Arachnida: Araneae: Linyphiidae: Micronetinae). Reichenbachia 34: 5-17.

Saaristo MI, Tanasevitch AV (2000) Systematics of the *Bolyphantes-Poeciloneta* genus-group of the subfamily Micronetinae Hull, 1920 (Arachnida: Araneae: Linyphiidae). Reichenbachia 33: 255-265.

Simon E (1929) Les Arachnides de France 6(3): 533-772.

Tanasevitch AV (1992) New genera and species of the tribe Lepthyphantini (Aranei Linyphiidae Micronetinae) from Asia (with some nomenclatorial notes on linyphiids). Arthropoda Selecta 1: 39-50.